

## 2019 Water Research in Montana



**US Bureau of Reclamation, Farmers Canal, Gallatin County:** The Farmers Canal Company and the MBMG have collected surface-water and groundwater data to identify sections of the Farmers Canal that would benefit from conservation efforts to reduce canal loss.

**Butte Mine Flooding Consent Decree Monitoring, Berkeley Pit Remote Sampling, Natural Resource Damage, Upper Clark Fork River:** The Berkeley Pit and associated underground workings in Butte are part of the larger Clark Fork Basin Federal Superfund Complex; the MBMG has been actively involved with groundwater and surface-water investigations and assessment for the past 35 years. The Butte Mine-Flooding monitoring network maintained by the MBMG, Montana Resources (MR), and ARCO consists of 78 ground-water sites (wells and mine shafts) and 2 surface-water sites.

**Yellowstone Controlled Ground Water Area Monitoring Program:** The 1994 compact between the State of Montana and the National Park Service created the Yellowstone Controlled Groundwater Area (YCGWA) to protect geothermal resources in Yellowstone National Park. In accordance with the compact the MBMG developed a long-term monitoring program using a network of wells and springs to establish baseline water quality and water temperature conditions. Monitoring began in 2005, and is focused around developed areas, including Cooke City along Soda Butte Creek, Gardiner along the Yellowstone River, Big Sky along the Gallatin River and West Yellowstone along the Madison River.

**DNRC RRG: Reducing Mobilization of Oil-Brine Salt to Streams, identifying historic oil brine contamination as a source of salt to the Musselshell River.** The DEQ identified some small streams that were unusually high in salinity. The MBMG is going to use isotope geochemistry to identify if and how much of the salt is sourced from old oil-brine ponds and identify land-surface use changes that could reduce mobilization of brine-salts (e.g. irrigation method changes).

**DNRC RRG: Measuring Groundwater Recharge in Flood to Pivot Irrigation Conversions.** The effect of irrigation method changes from flood to pivot on the groundwater/surface water hydrology of the Clark's Fork of the Yellowstone (nearest towns: Bridger/Belfry. Meets the Yellowstone at Laurel). This is primarily a water quantity study, specifically recharge to groundwater; however, the Clark's Fork is being considered by the DEQ to be listed as impaired for nitrate. This work will investigate the role irrigation method has upon nitrate loading in the surface water. Irrigation method and groundwater recharge is identified in the State Water Plan as in need of a better understanding in the short-term.

**EPSCOR NSF grant (multi-university)** will be building on the MBMG's long history of coal hydrology to investigate the sulfate cycle in coal-spoils aquifers and sulfate impacts to surface water ecology.

**Mitigating Impacts to the Fox Hills / Hell Creek Aquifer:** The MBMG, Richland County CD, and USDA Natural Resources Conservation Service (NRCS) will coordinate efforts and funding to conduct well remediation activities to mitigate declining water levels and pressure heads in the Fox Hills - Hell Creek Aquifer (FHHC). Remediation activities such as installing flow-regulating devices will reduce the waste and may slow the rate of water level decline in this important aquifer.

**Stock Water Supply Location and Flowing Well Rehabilitation Reports:** The MBMG compiles geology, aquifer data, and local water well information to produce reports to support new well drilling for stock water supply. The USDA Natural Resource Conservation Service provides cooperative funding for reports by MBMG and drilling wells by landowners.

WATER POLICY INTERIM  
COMMITTEE 2019-20

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- Boulder River Valley Groundwater, Jefferson County
- Upper Jefferson River Valley Groundwater, Madison County
- GIN-Stack Geothermal Database for Montana, Arizona Geological Survey
- Stillwater County Groundwater, Stillwater County Conservation District
- Rocker Timber Framing, MT Dept. of Environmental Quality
- Crystal & Bullion Mines Water Quality and Adit Discharge Monitoring, MT Department of Environmental Quality; US Environmental Protection Agency
- Long-Term Groundwater Monitoring at the Mouat (Columbus, MT) Superfund Site, MT Dept. of Environmental Quality
- Ground Water Assessment, US Forest Service
- Yellowstone Controlled Ground Water Area Monitoring Program, National Park Service
- National Ground Water Monitoring Network Montana, U.S. Geological Survey
- Ground Water Assessment in Immigrant Creek, US Forest Service.
- Eastern Montana Coal Lands Ground Water Evaluation, US Bureau of Land Management
- Montana Regional Coalbed Methane Groundwater Monitoring Program, Big Horn CD; MT Dept. of Natural Resource Conservation